REMARKS

Claims 1-39 are pending in the application. Claims 1-39 stand rejected.

Applicant respectfully requests reconsideration in view of the foregoing amendments and the remarks hereinbelow.

<u>Rejection of Claims under 35 U.S.C. 102:</u>

Claims 19-20 stand rejected under 35 U.S.C. 102(e) as being anticipated by Li et al. (U.S. 6,431,679). To support a rejection under 35 U.S.C. 102, it must be shown that the reference describes each limitation of the claim. However, Li et al. does not do so. Specifically, claim 19 claims as follows:

> 19. (Original) A proofing head assembly comprising:
> a) a spectrophotometer ;
> b) a color printhead; and
> c) a controller;
> wherein said spectrophotometer, said color printhead and said controller are joined to form an integral assembly.

In Li et al. a system and method are provided for automatically calibrating the contrast of an ink jet system using an optical-electronic sensor to detect an ink drop volume. Li et al. however, fails to describe a spectrophotometer, color printhead and controller joined to fom an integral assembly, and, actually teaches against such a combination. Specifically, the applicants respectfully submit the following comments with respect to Li et al.

1. The drawings in Li et al. do not show spectrophotometer 1040 joined to form an integral assembly with a color print head and controller.

The spectrophotometer 1040 of Li et al. is illustrated only in Fig. 10 of Li et al. However, spectrophotometer 1040 is shown separated from standard calibration curve generation module 630.

2. The description of Li et al. makes it clear that spectrophotometer 1040 of Li et al. is not an integral part of the system described therein.

Li et al. states as follows at col. 7, lines 59 – 67 and at col. 8, lines 1 – 26:

Standard Calibration Curve Generation Module

This module needs to be run only once, preferably during the product development stage. *The standard calibration curve generation module creates standard calibration data that is stored (such as on the memory device 640) and accessible to the printing module 660. In general, the standard calibration data is created by using a measurement and inverse process (described in detail below) to correspond to the ink drop volume of a variety of standard printhead assemblies. In a preferred embodiment, these are the same set of standard printhead assemblies used in the standard test module 620.*

FIG. 10 is an overall flow diagram of the standard calibration curve generation module 630 of the print contrast calibration system 140. First, a set of standard printhead assemblies is provided (box 1000). Then the process prints a serial evenly spaced gray patches (box 1010) for a selected printhead assembly 1020 using the default imaging printing procedure. Preferably, there are 256 patches printed have RGB index values ranging from 255, 254 to 0 and the same value for RGB. The same turn-on voltages are used for each printhead assembly as in the standard test module 620.

The printed serial patches are then scanned (box 1030) and measured with a spectrophotometer 1040 and a corresponding measurement value is determined for each index value. For each printhead assembly the measured result is correlated to the measured result of a printhead assembly having a normal drop volume. In this way, standard calibration curves are created for the printhead assembly (box 1050). The process then determines whether all the curves have been created for each printhead assembly (box 1060). If not, then the process returns to the beginning to obtain another printhead assembly (box 1000). Otherwise, the set of standard curves are stored (box 1070) in the memory device 640. ***(emphasis supplied)***

From this, it is clear that Li et al. teaches that a spectrophotometer 1040 is used to facilitate the process of determining standard calibration curves – a process that is done **only once, preferably during the product development stage.** In Li et al., during product development, a printhead is used to print test patches in response to a series of commands that are sent to the printhead. The test patches are each intended to reflect a different level of ink droplet volume and representative of the full range of ejection possibilities for the print head. (See for

example Fig. 9). The purpose of this spectrophotometer is to determine a color that comes from each test pattern and to develop a set of curves that associates volumes of ink ejected by the print head with particular color densities, so that when an instruction to print a particular color is received, the curve can be used to determine an ink drop ejection volume.

Accordingly, the detailed description is also consistent with the interpretation that spectrophotometer 1040 is not an integral component of the system as there is no use for such a device except during the product development stage.

3. Li et al. describes the use of an optical-electronic sensor 610 and a printhead joined but not a spectrophotometer, color printhead and controller joined to form an integral assembly.

It will be appreciated that over time, wear, temperature and other factors can cause variation in the operation of the ink jet printhead that can cause olors to be printed in a manner that is not consistent with the yield curve. This happens because the printhead ejects more or less ink than is expected in response to an instruction. Accordingly, Li et al. provides an optical electronic sensor 610 to measure the amount of light reflecting from a printed page and a comparator 630 to ensure that the amount of ink deposited during a printing operation (as suggested by the amount of light reflected by the page) is consistent with the instructions provided to the printhead. By monitoring such conditions over time, the comparator can determine when variations begin to occur and can also determine compensations. Further, Le et al. also uses signals from the optical electronic sensor 610 and an installation module 650 to ensure that droplet volumes are consistent when different print heads are used in order to ensure consistency between printheads.

It will be appreciated that the system of Li et al. provides sensor 610 as a simple way to monitor ink jet volumes without actually measuring the color of sample patches that are formed on the printhead. Accordingly sensor 610 would be unnecessary if the system of Li et al incorporated a spectrophotometer 1040 as an integral component. Such a spectrophotometer could do more than sensor 610 – specifically, spectrophotometer 1040 could provide actual color measurements.

It is clear from this that Li et al. actually teaches a system that uses optical electronic sensor 610 that provides data for calibration that is suggestive of the color content of the display and that can be used to compensate for changes that occur during the life of a printhead or changes to the pritnhead but that is less accurate than the data that could be obtained from a spectrophotometer. Such an approach has the advantage of low cost. However, this approach actually teaches away from providing a spectrophotometer, color printhead and controller that are joined to form an integral assembly.

For these reasons, it is respectfully submitted that claim 19 and all claims that depend thereforom is in a conditon for allowance

<u>Rejection of Claims under 35 U.S.C. 103:</u>

Claims 1-18 and 21-39 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Miyazaki et al. (U.S. 6,710,796) in view of Li et al. (U.S. 6,431,679). Claim 1 claims

1. (Original) A proofing head assembly comprising:

a) a color light analyzer;

b) a color printhead; and

c) a housing joining the printhead to the color light analyzer and directing the printhead and color light analyzer at a media plane.

The Office Action contends that claim 1 is obvious in view of Miyazake et. al in view of Li. In this regard, the Office Action contends that Miyazaki et al. discloses:

> ***1. A proofing head assembly comprising a) a color light analyzer (please note Fig. 11 and 12, item 61 the light emitting element array which acts as the light analyzer, Col. 11, lines 23 – 27) b) a color printhead (please note Fig. 11 and 12 item 60 the print head, column 11, lines 23 – 27)***

However, the applicants respectfully submit that this interpretation of Miyazaki et al. is not correct. Specifically, the applicants note that the system of Miyazaki et al. is a system for recording an image on an instant film. Accordingly, it is necessary to apply light to the film in an image wise fashion. In

the embodiment of Figs. 11 and 12, colored light is supplied in a printhead 60 by the light emitting element array 61. This colored light is modulated so that an imagewise contrast pattern is formed on the film. Col. 11, lines 23 – 27 explain this in further detail as follows:

> *FIGS. 11 and 12 , another preferred embodiment is depicted, in which a light-emitting element array* ***61*** *as light source is incorporated in a printing head* ***60*** *. The light-emitting element array* ***61*** *includes light-emitting elements in a number enough for the number of pixels. The light-emitting element array* ***61*** *is driven by a light-emitting element driver* ***62*** *, and controlled for intensity of light to emit, the light-emitting element driver* ***62*** *constituting a light amount adjustor. The light from the light-emitting element array* ***61*** *passes the color separation filter unit* ***22*** *and becomes printing light of any of the red, green and blue colors, and then passes the SELFOC lens array* ***23*** *to come incident upon the instant photo film* ***14*** *. The use of the light-emitting element array* ***61*** *is advantageous as the LCD micro shutter is unnecessary to reduce the number of the parts.*

Accordingly, it is clear that the light element array 61 does not perform light analysis but rather supplies colored light and is an essential part of printhead 60, not a separate device.

2. a housing joining the printhead to the color light analyzer (please note Fig. 12, items 60 and 61 which are housed in the print head 60, column 11, lines 21 – 35)

Here it is clear from Col. 11, lines 21 – 35 that item 60 is a printhead that uses a light emitting element array 61 to generate light for forming images on the instant film.

3. However, Miyazaki et al. does not disclose: directing the printhead and color light analyzer at a media plan. On the other hand Li et al. disclose" directing the printhead and color light analyzer at a media plane.

As is discussed above Li et al. do not disclose a color light analyzer but, instead, Li et al. disclose a sensor 610 as a simple way to monitor ink jet volumes without actually measuring the color of sample patches that are formed on the printhead. Li et al. do discuss a spectrophotometer, however as has been

established above, Li et al. does not teach or suggest that such a spectrophotometer is incorporated into the printer, but rather teach the use of a spectrophotometer once during the product development stage.

It is respectfully submitted that for the reasons discussed above with reference to claims 1 – 18, claims 21 – 39 are believed to be allowable over the cited combination. Specifically, the references fail to support the interpretation provided to them and, inter alia, the references alone and in combination fail to teach or suggest a proofing head having a color light analyzer and a color printhead joined by a housing that directs the printhead and color light analyzer at a media.

It is respectfully submitted, therefore, that in view of the above amendments and remarks, that this application is now in condition for allowance, prompt notice of which is earnestly solicited.

Respectfully submitted,

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